





buy little boxes that got 50 miles per gallon; now we can't give them away. Someday, though, there will be another OPEC shock and gas prices will go up, and we'd better be ready with good, efficient transportation."

Some in the industry are already looking beyond the next price rise to the gradual depletion of oil supplies.

"The research is done," I was told by Thomas J. Feaheny, vice president for vehicle research at Ford. "The only obstacles are economic. We could run automobiles on methanol now, but it takes years to build the plants to produce the fuel."

West Germany is taking a serious look at alternate fuels. I flew to Berlin, where 600 cars running on a variety of them are being closely monitored. Most are powered by M-15 (15 percent methanol, 85 percent gasoline). A smaller group runs on 100 percent methanol. A number of electric cars are also being watched, and 20 cars powered by hydrogen fuel are to join the test before it ends in 1984.

"The M-15 fuel requires fewer engine adjustments and brings fewer changes in performance," said Rainer Paulsen, engineer with a transport research association. "But the M-100 holds more promise because of its greater substitution for petroleum. Of course it also requires more sophisticated changes in the motor.

"The Federal Republic now produces about a million tons of methanol a year," said Herr Paulsen. "A coal-gasification project now under construction could raise that to eight million tons, enough to run only 3 percent of our 25 million vehicles."

The verdict on the electric cars was a familiar one—limited range. There were no results available on the hydrogen cars still being built. As a fuel, hydrogen is virtually inexhaustible, and it burns without polluting. Extracting it from natural gas, coal, or even plain water, however, remains too expensive to make it competitive with more available fuels, and it is difficult to handle.

Also in the distance are radical new engines. I rode in a car with a whistle under the hood—General Motors' turbine engine fueled by coal dust. This plentiful mineral could free us from OPEC but would dirty the air unless cleaned of impurities. And all turbine engines await the low-cost ceramics

that can dependably withstand temperatures of 2350°F.

Another promise for breaking America's costly gasoline habit may be shown by an engine invented in the 1940s by an oil company. The Texaco Controlled-Combustion System (TCCS) injects fuel directly past the spark plug and into a cyclonic whirl in the center of the rising piston.

"The fuel burns continuously and completely," said project manager William Tierney, who has worked on the engine for nearly 40 years. "That means octane ratings are unnecessary. We can burn many fuels."

Part of every barrel of crude oil that yields gasoline must be burned in the refining process. Using other fuels for TCCS engines could cut process-fuel needs by about half.

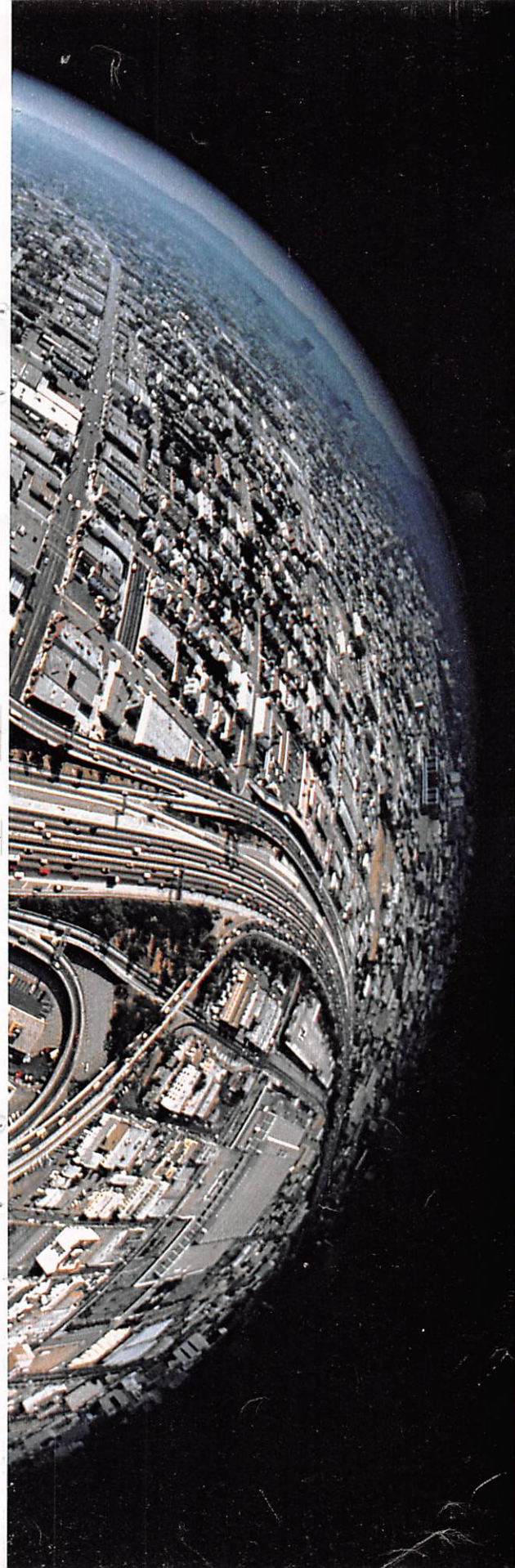
Gasoline, heating oil, diesel, alcohol—the TCCS will run on any of them. The United Parcel Service will soon be road testing 500 TCCS-powered vehicles and eventually expects to cut fleet-wide fuel consumption by 15 million gallons a year.

**C**HANGES in the conventional engines are on the horizon. An Indiana firm is developing a diesel that eliminates the conventional cooling system, making more efficient use of wasted exhaust energy. Superlubricants such as graphite could improve engine efficiency as much as 5 percent.

Two Arizona inventors have designed a valve with a double screen that could help engines run cleaner, cooler, and more economically. The device vaporizes gasoline and forces it to mix more thoroughly with air, allowing a more complete burn. Even with low-octane gasoline, it reduces emissions and improves performance.

Performance. The word emerged in nearly every car conversation. Often it means quickness more than headlong speed, and it spells danger if unadvisedly unleashed. But it cannot be denied that from the first hiccupping horseless carriages to the screaming blur of Formula One racing cars, the thrill of exceeding human limits in movement has been a seductive brew.

At Elkhart Lake, Wisconsin, I met a part-time sports-car racer who caught the speed bug late. P. L. Newman had never competed in an automobile until the age of 47. In 11



**Serpentine symbol** of the auto's preeminence, the four-level interchange of the Santa Monica Freeway (**left, top level**) and the crossing Harbor Freeway in Los Angeles handles more than 400,000 vehicles a day. With budget limitations curtailing expansion of California's 15-billion-dollar freeway system, state transportation officials seek to smooth traffic flow with on-ramp signals, signs that flash warnings of disruptions ahead, and in-pavement sensors that give highway patrolmen early notice of stoppages due to accidents.

Downtown Detroit appears through the windshield and on the dashboard (**above**) of a 1982 Buick equipped with a prototype General Motors navigation system. Using radio guidance signals, the system's computer indicates the driver's location on street grids projected by reprogrammable cartridges. GM plans to link the device to satellites and offer it as an option on top-line models within the decade.





years of racing since then he has won two national amateur driving championships and narrowly missed winning a third.

"Acting wasn't very competitive for me any more," said Newman, who has also starred in 32 films. "Now the passion for racing seems to feed into my acting as well."

A flat tire knocked him out of the running that weekend, but an evening's drive to a go-kart track demonstrated to me that when the racing bug bites, it bites hard. As we waited for a turn at the sputtering toys, the famous cobalt eyes studied each vehicle as it passed. "Number five is a zinger," he murmured.

Our turn came, and Paul Newman, who had muscled a 400-horsepower Datsun 280ZX that day, sprinted gleefully to his pick of half-horsepower machines.

North of San Francisco at Sears Point I

took a four-day course in road racing to learn what it was all about. Instructors at the Bob Bondurant school taught me to look for the proper apex of a curve, how to shift the weight of a car to avoid sliding, and how to control a spin if I failed in both of the above.

We began with sedans, moved to sports cars, and then I was strapped painfully tight and nearly reclining into the seat of a Formula Ford, an open-wheeled race car. At velocities exceeding 100 miles an hour the 2.5-mile circuitous track streamed under me in a loose, unraveling ribbon, and corners blew at me like a shotgun blast. What racing is all about, I learned, is total concentration. What it causes is an exhilaration and addiction borne by the wine of speed.

Is another heady brew coursing through American veins at more reasonable speeds?